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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/389,289	09/02/1999	SOICHI TSUMURA	P/1905-87	5253

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EXAMINER	
BURD, KEVIN MICHAEL	
ART UNIT	**PAPER NUMBER**
2631	

DATE MAILED: 10/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/389,289	TSUMURA, SOICHI	
	Examiner	Art Unit	
	Kevin M Burd	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 September 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

1. This office action, in response to the Request for Continued Examination and the amendment filed 9/23/2003, is a non-final office action.

Response to Amendment

2. Applicant's arguments filed 9/23/2003 have been fully considered but they are not persuasive. Applicant filed substantially the same remarks in the response after final received 7/23/2003. These arguments were addressed in the advisory action filed 8/7/2003. The advisory action stated Miya discloses the transmitted signals containing the pilot symbols in figure 11 are received and detection takes place (column 4, lines 16-19). In addition, Chalmers discloses the circuit shifts the sample timing phase so that the sampling occurs at the maximum opening in the receiver eye pattern (i.e. sampling in the middle of the digital symbol) to minimize intersymbol interference in column 13, lines 19-24. The rejections of the claims are maintained and stated below.

Figure 11 of Miya shows the data of a channel between two pilot symbols. The rejection of newly added claim 8 is stated below

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious

at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miya et al (US 6,351,458) in view of Chalmers (US 5,375,146).

Regarding claims 1, 5 and 8, Miya discloses an interpolation type synchronous detection system (column 3, lines 1-19). Pilot symbols are periodically interpolated in information symbols to be transmitted, the transfer function is estimated and detection is carried out. Figure 11 illustrates an example of the channel format. Miya does not disclose updating at a middle point of the data frame a reception sampling point. However, Chalmers discloses the circuit shifts the sample timing phase so that the sampling occurs at the maximum opening of the receiver eye pattern (i.e. sampling in the middle of a digital symbol) to minimize intersymbol interference (column 13, lines 19-23), thereby reducing the data error rate. This allows the interpolation synchronous detection in the receiver (column 14, lines 34-38). It would have been obvious of one of ordinary skill in the art to shift the sample timing phase so the sampling occurs at the middle point to minimize intersymbol interference as disclosed by Chalmers in the method and system of Miya.

4. Claims 2, 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miya et al (US 6,351,458) in view of Yamada et al (US 5,822,364) further in view of Chalmers (US 5,375,146).

Regarding claims 2, 4 and 7, Miya discloses an interpolation type synchronous detection system (column 3, lines 1-19). Pilot symbols are periodically interpolated in

information symbols to be transmitted, the transfer function is estimated and detection is carried out. Figure 11 illustrates an example of the channel format. Miya does not disclose using the complex conjugate for performing the coherent detection. Yamada discloses the demodulated data is obtained after completion of the pilot coherent detection scheme with interpolation using the complex conjugate as stated in column 1, lines 11-38. This is a critical component of correctly computing the coherent detection. It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the coherent detection scheme of Yamada into the detection scheme of Miya to ensure the correct values are detected. In addition, Miya does not disclose updating at a middle point of the data frame a reception sampling point. However, Chalmers discloses the circuit shifts the sample timing phase so that the sampling occurs at the maximum opening of the receiver eye pattern (i.e. sampling in the middle of a digital symbol) to minimize intersymbol interference (column 13, lines 19-23). This allows the interpolation synchronous detection in the receiver (column 14, lines 34-38). It would have been obvious of one of ordinary skill in the art to shift the sample timing phase so the sampling occurs at the middle point to minimize intersymbol interference as disclosed by Chalmers in the method and system of the combination of Miya and Yamada.

5. Claims 1, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vasic (US 6,178,194) in view of Chalmers (US 5,375,146).

Regarding claims 1 and 5, Vasic discloses a receiver, which interpolates the channel measurement provided by the pilot symbols to obtain a phase and amplitude reference for coherent detection (column 3, lines 16-19). The transfer function of the channel is estimated by using the pilot symbols and the data symbols are detected on the basis of the estimated transfer function (column 3, lines 14-32). The data channel is shown in figure 1. Vasic does not disclose updating at a middle point of the data frame a reception sampling point. However, Chalmers discloses the circuit shifts the sample timing phase so that the sampling occurs at the maximum opening of the receiver eye pattern (i.e. sampling in the middle of a digital symbol) to minimize intersymbol interference (column 13, lines 19-23). This allows the interpolation synchronous detection in the receiver (column 14, lines 34-38). It would have been obvious of one of ordinary skill in the art to shift the sample timing phase so the sampling occurs at the middle point to minimize intersymbol interference as disclosed by Chalmers in the method and system of Vasic.

Regarding claim 6, Vasic discloses a closed loop system that controls the gain in order to maintain optimal transmit power (column 2, lines 49-67).

6. Claims 2-4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vasic (US 6,178,194) in view of Yamada et al (US 5,822,364) further in view of Chalmers (US 5,375,146).

Regarding claims 2, 4 and 7, Vasic discloses a receiver, which interpolates the channel measurement provided by the pilot symbols to obtain a phase and amplitude

reference for coherent detection (column 3, lines 16-19). The transfer function of the channel is estimated by using the pilot symbols and the data symbols are detected on the basis of the estimated transfer function (column 3, lines 14-32). The data channel is shown in figure 1. Vasic does not disclose using the complex conjugate for performing the coherent detection. Yamada discloses the demodulated data is obtained after completion of the pilot coherent detection scheme with interpolation using the complex conjugate as stated in column 1, lines 11-38. This is a critical component of correctly computing the coherent detection. It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the coherent detection scheme of Yamada into the detection scheme of Vasic to ensure the correct values are detected. In addition, Vasic does not disclose updating at a middle point of the data frame a reception sampling point. However, Chalmers discloses the circuit shifts the sample timing phase so that the sampling occurs at the maximum opening of the receiver eye pattern (i.e. sampling in the middle of a digital symbol) to minimize intersymbol interference (column 13, lines 19-23). This allows the interpolation synchronous detection in the receiver (column 14, lines 34-38). It would have been obvious of one of ordinary skill in the art to shift the sample timing phase so the sampling occurs at the middle point to minimize intersymbol interference as disclosed by Chalmers in the method and system of the combination of Vasic and Yamada.

Regarding claim 3, Vasic discloses a closed loop system that controls the gain in order to maintain optimal transmit power (column 2, lines 49-67).

7 Claims 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Higashi et al (US 5,692,015) in view of Yamada et al (US 5,822,364) further in view of Chalmers (US 5,375,146).

Regarding claims 7, Higashi discloses a coherent detection method and system including a step of estimating a transfer function using pilot signals (abstract). The step of estimating the transfer function including using pilot symbols contained in the received signal as well as pilot symbols generated from a pilot symbol generator (column 5, lines 32-42). The pilot symbols are located before and after the information signal (figure 1). Detection occurs by interpolating the transfer function. The circuit is shown in figure 3. Higashi does not disclose using the complex conjugate for performing the coherent detection. Yamada discloses the demodulated data is obtained after completion of the pilot coherent detection scheme with interpolation using the complex conjugate as stated in column 1, lines 11-38. This is a critical component of correctly computing the coherent detection. It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the coherent detection scheme of Yamada into the detection scheme of Higashi to ensure the correct values are detected. In addition, Higashi does not disclose updating at a middle point of the data frame a reception sampling point. However, Chalmers discloses the circuit shifts the sample timing phase so that the sampling occurs at the maximum opening of the receiver eye pattern (i.e. sampling in the middle of a digital symbol) to minimize intersymbol interference (column 13, lines 19-23). This allows the interpolation synchronous detection in the receiver (column 14, lines 34-38). It would have been obvious of one of

ordinary skill in the art to shift the sample timing phase so the sampling occurs at the middle point to minimize intersymbol interference as disclosed by Chalmers in the method and system of the combination of Higashi and Yamada.

Contact Information

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 872-9314, (for formal communications intended for entry or for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Burd, whose telephone number is (703) 308-7034. The Examiner can normally be reached on Monday-Thursday from 9:00 AM - 6:00 PM.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3800.

Kevin M. Burd
PATENT EXAMINER
10/23/03